REMARKS

Claims 1-16 are pending in the application. By this paper, claims 1, 4, 7, 10, 13 and 16 are amended. No new matter is added by these amendments, which are fully supported in the specification as filed. Reconsideration and allowance of claims 1-16 are respectfully requested.

Prior Art Rejection

Claims 1-16 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. patent publication umber 2004/0156079 A1 to Marshall, et al. ("Marshall"). Reconsideration and allowance of claims 1-16 in light of the amendments and arguments herein are respectfully requested. It is submitted that each of independent claims 1, 4, 7, 10, 13 and 16 includes limitations not shown, described or suggested by Marshall.

The present invention as defined in claim 1 relates to rendering data for producing a hardcopy image at a printer. An application produces image data at a host computer. Based on the image data for a pixel, the host computer produces a multi-bit interim data value which includes information to allow the printer to reproduce a pixel. The multi-bit value also includes control parameters for a print engine of the printer, which are used by the printer to improve print quality.

According to the Office Action, Marshall discloses at paragraph [0017], lines 5-12 the following limitation of claim 1:

> an image processor, based on image data contained in a pixel or a group of pixels in the page data, to render interim data that contains a multi-bit value per plane per pixel including print engine control information for the pixel or the group of pixels

Actually, Marshall fails to disclose the unique feature of rendering interim data based on image data, as recited by claim 1. Further, Marshall fails to disclose communicating the interim data, such as from a host machine to a printer. Claims 4, 7, 10, 13 and 16 include similar features. In fact, Marshall only discloses conveying image data from the host to the printer. Specifically, Marshall recites,

> …driver 110 is executed by processor 104 to render the data 112 to be printed into **multi-bit image data 114**. The data 112 to be printed may be any type of printable data, such as image files, word processing files, etc. In one form of the invention, **multi-bit image data 114** includes a plurality of pixels, with each pixel being represented by a multi-bit value (i.e., each pixel is represented by an N-bit value, where N is greater than one). In one embodiment, each pixel in **multi-bit image data 114** is represented by a 2-bit value (e.g., black, white, and two gray levels). In another embodiment, each pixel in multi-bit image data 114 is represented by a 4-bit value….
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> **After rendering data 112 into multi-bit image data 114, computer 102 outputs the multi-bit image data 114 to printer 120 via communication link 118.** As shown in FIG. 1A, the received multi-bit image data 114 is stored in memory 128 of printer 120, where it is retrieved and processed by laser print engine 130 as described in further detail below with reference to FIGS. 2-5.

Marshall, paras. [0017], [0019], *(emphasis added)*. Thus, Marshall fails to disclose rendering interim data based on image data and communicating the interim data from a host machine. To the contrary, Marshall specifically discloses providing image data directly to a printer. Marshall does not even suggest that interim data may be produced before communicating the data from the host.

The present application is directed to a unique problem not addressed by Marshall or any reference of record. Specifically, it is explained in the Background section that prior solutions use original print data to generate single bit print data on a host machine. This speeds transfer of data from the host machine to the printer, but "there is significant loss of image detail" upon rendering the image on paper. Paragraph [0001].

The present application improved on conventional systems by rendering at the host machine **interim data** that contains a multi-bit value, including print engine control information, as recited in claim 1. Thus, the interim data to be communicated from the host to the printer includes information defining the image and information to control the print engine, without the significant loss of image detail that affects conventional solutions. To clarify the distinction, claim 1 has been amended to emphasize that the interim data is rendered "to effect print quality enhancements." Support for this amendment may be found at paragraph [0013] of the application. Claims 4, 7, 10, 13 and 16 have been similarly amended.

In various embodiments, the multi-bit interim data may include print parameters (see, e.g., claim 2) or the print parameters may define particular print quality enhancements such as

Toner Miser Mode, Toner Explosion Or Edge Roll Off (see, e.g., claim 3). These are features which may be implemented by the printer upon receipt of the interim data from the host and upon recognition at the printer that, for example, Toner Miser Mode should be implemented. These enhancements are explained in, for example, paragraphs [0020] – [0022] of the present application.

In contrast to the rendering of interim data and the advantages it provides, Marshall conveys actual image data from the host to the printer. Marshall's system then does image enhancement at the printer. The printer determines pulse width for a laser pulse and a justification value for each pixel. This information is encoded in the pcode value determined by the printer (Marshall para. [0026], lines 1-8). Note, though, that this determination by Marshall is done at the printer, not at the host machine. As is explained in the Background of the present application (see para. [0002]), this level of data processing at the printer may require "extensive hardware circuits and / or high-powered processors."

Marshall does disclose rendering data to be printed 112 into multi-bit image data 114, which may be a 2-bit value for a pixel (Marshall para. [0017]). For example, the two bits may include bits defining black, white and two gray levels among the four possibilities for the pixel. However, this is not interim data of the type defined by the pending claims. Claim 1 recites an image processor to render interim data including "print engine control information for the pixel or the group of pixels to effect print quality enhancements." Marshall's multi-bit data is just the image data, defining, for example, whether a particular pixel should be black, white or one of two gray values. Marshall does not show the further feature of print engine control information in interim data to be conveyed to the printer from a host.

Conclusion

Thus, the present invention in accordance with claims 1-16 includes limitations nowhere shown, described or suggested by Marshall, including rendering interim data at the host machine. The interim data includes a multi-bit value including print engine control information to effect print quality enhancements, as recited in claim 1. Independent claims 4, 7, 10, 13 and 16 include similar limitations. These features are missing from Marshall.

Moreover, a system or method in accordance with the present invention defined by claims 1-16 provides substantial advantages over a conventional device. As explained at para. [0006] of the present application, "the processing required to generate high quality print output is shifted from the printing device to the host machine. This allows for minimal hardware resources on the printing device." No extensive hardware circuits or high-powered processors are required at the printer. This reduces the overall cost and complexity of the printer. Accordingly, withdrawal of the rejection of claims 1-16 is respectfully required.

With this response, the application is believed to be in condition for early action on the merits. Should the examiner deem a telephone conference to be of assistance in advancing the application to allowance, the examiner is invited to call the undersigned attorney at the telephone number below.

Respectfully submitted,

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January 16, 2007
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